

What is claimed is:

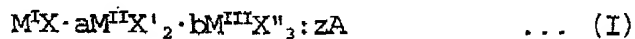
1. A method for preparing a stimuable phosphor sheet comprising a support and a stimuable phosphor layer deposited thereon which comprises applying an electron beam to a stimuable phosphor or a source thereof in a vacuum to vaporize the phosphor or the source and depositing the vaporized phosphor or source on the support, wherein the stimuable phosphor or source to be vaporized is in the form of a solid having a relative density in the range of 80% to 98%.

2. The method of claim 1, wherein the relative density of the solid is in the range of 90% to 96%.

3. The method of claim 1, wherein the solid of stimuable phosphor or source is in the form of pellet which has been prepared by compressing a corresponding phosphor or source.

4. The method of claim 1, wherein the electron beam is applied to the stimuable phosphor or source thereof at an accelerating voltage in the range of 1.5 kV to 5.0 kV.

5. The method of claim 1, wherein the stimuable phosphor or source to be vaporized is a stimuable alkali metal halide phosphor having an essential composition of the formula (1):



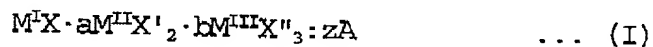
in which  $M^I$  represents at least one alkali metal selected from the group consisting of Li, Na, K, Rb and Cs;  $M^{II}$  represents at least one divalent metal selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ni, Cu, Zn and

Cd;  $M^{III}$  represents at least one trivalent metal selected from the group consisting of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Al, Ga and In; each of X, X' and X" independently represents at least one halogen atom selected from the group consisting of F, Cl, Br and I; A represents at least one metal selected from the group consisting of Y, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Na, Mg, Cu, Ag, Tl and Bi; and each of a, b and z is a number respectively satisfying the conditions of  $0 \leq a < 0.5$ ,  $0 \leq b < 0.5$ ,  $0 \leq z < 0.2$ .

6. A method for preparing a stimuable phosphor sheet comprising a support and a stimuable phosphor layer deposited thereon which comprises applying an electron beam to a stimuable phosphor or a source thereof in a vacuum to vaporize the phosphor or the source and depositing the vaporized phosphor or source on the support, wherein the electron beam is applied to the stimuable phosphor or source thereof at an accelerating voltage in the range of 1.5 kV to 5.0 kV.

7. The method of claim 6, wherein the accelerating voltage of electron beam is in the range of 2.0 kV to 4.0 kV.

8. The method of claim 6, wherein the stimuable phosphor or source to be vaporized is a stimuable alkali metal halide phosphor having an essential composition of the formula (1):



in which  $M^I$  represents at least one alkali metal selected from the group consisting of Li, Na, K, Rb and Cs;  $M^{II}$  represents at least one divalent metal selected from the

group consisting of Be, Mg, Ca, Sr, Ba, Ni, Cu, Zn and Cd;  $M^{III}$  represents at least one trivalent metal selected from the group consisting of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Al, Ga and In; each of X, X' and X'' independently represents at least one halogen atom selected from the group consisting of F, Cl, Br and I; A represents at least one metal selected from the group consisting of Y, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Na, Mg, Cu, Ag, Tl and Bi; and each of a, b and z is a number respectively satisfying the conditions of  $0 \leq a < 0.5$ ,  $0 \leq b < 0.5$ ,  $0 \leq z < 0.2$ .

9. A method for preparing a stimuable phosphor sheet comprising a support and a stimuable phosphor layer deposited thereon which comprises applying an electron beam to a stimuable phosphor or a source thereof in a vacuum to vaporize the phosphor or the source and depositing the vaporized phosphor or source on the support, wherein the support is heated by a thermal energy supplied by a heating means when the vaporized phosphor or source is deposited and, after the deposition is complete, the supply of thermal energy from the heating means to the support is gradually reduced to cool the support gradually.

10. The method of claim 9, wherein the support is cooled at a rate in the range of  $1^{\circ}\text{C}/\text{min.}$  to  $20^{\circ}\text{C}/\text{min.}$

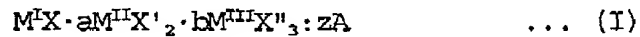
11. The method of claim 9, wherein the electron beam is applied to the stimuable phosphor or source thereof at an accelerating voltage in the range of 1.5 kV to 5.0 kV.

12. The method of claim 9, wherein the stimuable phosphor or source to be vaporized is in the form of a

solid having a relative density in the range of 80% to 98%.

13. The method of claim 12, wherein the electron  
5 beam is applied to the stimuable phosphor or source  
thereof at an accelerating voltage in the range of 1.5 kV  
to 5.0 kV.

14. The method of claim 9, wherein the stimuable  
10 phosphor or source to be vaporized is a stimuable alkali  
metal halide phosphor having an essential composition of  
the formula (1):



15 in which  $M^I$  represents at least one alkali metal selected  
from the group consisting of Li, Na, K, Rb and Cs;  $M^{II}$   
represents at least one divalent metal selected from the  
group consisting of Be, Mg, Ca, Sr, Ba, Ni, Cu, Zn and  
20 Cd;  $M^{III}$  represents at least one trivalent metal selected  
from the group consisting of Sc, Y, La, Ce, Pr, Nd, Pm,  
Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Al, Ga and In;  
each of X, X' and X" independently represents at least one  
halogen atom selected from the group consisting of F, Cl,  
25 Br and I; A represents at least one metal selected from  
the group consisting of Y, Ce, Pr, Nd, Sm, Eu, Gd, Tb,  
Dy, Ho, Er, Tm, Yb, Lu, Na, Mg, Cu, Ag, Tl and Bi; and  
each of a, b and z is a number respectively satisfying  
the conditions of  $0 \leq a < 0.5$ ,  $0 \leq b < 0.5$ ,  $0 \leq z <$   
30 0.2.

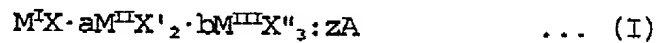
15. A stimuable phosphor sheet comprising a sup-  
port and a vapor deposited stimuable phosphor layer, and  
a protective film, wherein the support has a frame unit-  
35 edly protruded from a circumference of the support, the  
phosphor layer is enclosed with the frame, and the pro-

protective film is airtightly sealed to the frame.

16. The stimuable phosphor sheet of claim 15, wherein the support is made of quartz or metal.

17. The stimuable phosphor sheet of claim 15, wherein the protective film is made of a silicate glass deposited on the phosphor layer.

18. The method of claim 15, wherein the stimuable phosphor is a stimuable alkali metal halide phosphor having an essential composition of the formula (1):



in which  $M^I$  represents at least one alkali metal selected from the group consisting of Li, Na, K, Rb and Cs;  $M^{II}$  represents at least one divalent metal selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ni, Cu, Zn and Cd;  $M^{III}$  represents at least one trivalent metal selected from the group consisting of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Al, Ga and In; each of X, X' and X'' independently represents at least one halogen atom selected from the group consisting of F, Cl, Br and I; A represents at least one metal selected from the group consisting of Y, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Na, Mg, Cu, Ag, Tl and Bi; and each of a, b and z is a number respectively satisfying the conditions of  $0 \leq a < 0.5$ ,  $0 \leq b < 0.5$ ,  $0 \leq z < 0.2$ .

19. A method for preparing a stimuable phosphor sheet of claim 15, comprising the steps of:

applying an electron beam to a stimuable phosphor or a source thereof in a vacuum to vaporize the phosphor or the source and depositing the vaporized phosphor or

source on a support having a frame unitedly protruded from a circumference of the support in the area surrounded by the frame, and

5 providing a protective film on the phosphor layer and the frame of the support so as to airtightly seal a space surrounded by the frame.

20. The method of claim 19, wherein the electron beam is applied to the stimuable phosphor or source thereof which is in the form of a solid having a relative density in the range of 80% to 98%, at an accelerating voltage in the range of 1.5 kV to 5.0 kV.

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